

**Waimanalo Gulch Sanitary Landfill
Stormwater Management Update and Contingency Plan
2-1-11**

Following the recent major storm events, Waste Management of Hawaii (WMH) has assessed and evaluated its stormwater control systems for effectiveness. Below is an update of ongoing measures being taken to prevent future storm damage at the site, and document efforts to further contain potential storm water. WM believes that these measures will prevent waste material and storm water that may have come into contact with waste from exiting the facility in the event of a major storm.

- 1) The 36-inch drain was designed to handle water falling within the landfill footprint, upstream of the waste disposal area, during landfilling operations. It was also intended to mitigate runoff during small storms until the diversion channels are in place. The west side drainage channel has been designed to control the 100-year storm and will mitigate the impact of storms with higher return periods.
 - The effectiveness of 36-inch inlet structure for the up canyon drainage system has been restored and improved. The area immediately surrounding the inlet structure has been re-graded and armored with large boulders to prevent high sediment loading from clogging the inlet. A diversion berm immediately downstream of this diversion structure has been reinforced and re-built to further direct any stormwater into the inlet structure.
 - The area surrounding the future Cell E-8 is being excavated down to the elevation of the 36-inch pipe inlet structure. This effort will help to create stormwater retention, dissipate stormwater velocities, and drop out sediment as it moves from the upper reaches of the construction area towards the 36" inlet structure. This effort has been ongoing since 1/18.
- 2) Temporary containment berm directly south of Cell E6

This berm was constructed by WMH's contractor during the 12-19-10 storm to contain large stormwater flows originating from up canyon and prevent a catastrophic discharge from exiting the site. The berm did safely contain this storm, and was subsequently substantially reinforced prior to the storm that occurred on 1-13-11. The storm water that was contained behind the berm has now been removed, creating a storage area capable of containing water from a similar rainfall event. Preliminary stability analysis indicates the berm has adequate strength to contain the runoff.
- 3) Establish a functioning Western Drainage System.

In order to establish a functioning Western Drainage System, the up canyon conveyance structure must be in place to divert storm water into the box culvert and fiberglass piping system. Additionally, the box culvert invert that originates at the diversion structure must be connected to the 78" fiberglass piping located on the upper bench above Cell E-6. WMH's contractor continues to work double shifts on these two fronts. A functioning Western Drainage System will be in place within 2 weeks, barring any additional large rainfall events that would prevent this work from being safely completed.

- 4) WM employees monitor weather conditions routinely, in order to prepare for and take emergency action in the event of a major storm event affecting the site. WMH has reviewed our Storm water Pollution Control Plan (SPCC) and will update accordingly as the western storm water diversion project progresses.
- 5) Interim storm event management

Section (4) of USEPA's letter dated January 28, 2011, approving resumption of landfill operations within specified areas of Cell E6, contains a requirement that WMH list available equipment and personnel to be deployed in response to major storm events that may occur prior to the functional completion of the west side drainage diversion project. These capabilities are listed below.

- The WMH general contractor for the west side drainage diversion project maintains on site six excavators, six articulated dump trucks, four bulldozers, three front end loaders, two 8 inch diameter and one twelve inch diameter pumps. In addition WMH maintains three bulldozers, one front end loader, one road grader, two articulated dump trucks, one backhoe, one fuel truck, one lube truck, and one six inch diameter pump.
- Joe Whelan, Justin Lottig, Jesse Frey, and Rick Kahalewai are available to assist in managing storm water management, in addition to four equipment operators and two maintenance technicians. Additionally, the general contractor maintains appropriate operators for all equipment listed above.
- WMH employs a security service which is on site after business hours seven days per week who are responsible for alerting WMH management in the event of a major after hours storm event. During business hours the above listed WMH employees and the general contractor maintain sufficient trained employees to respond to storm events.
- The sedimentation basin, temporary berm in the Cell E6 area, 36 inch storm water diversion piping, and general facility drainage ditches will be monitored and maintained during potential storm events.
- In the event of a major storm event, WMH employees and contractors will assess on site conditions to determine if there is a potential threat to human life or injury, as well as equipment damage, or environmental harm as a result of the storm. WMH will take appropriate actions to keep all ditches and storm water conveyance structures operational and free of debris, once it is determined that these activities can be performed safely. WMH will monitor the condition of the Cell E6 berm in relation to the amount of storm water that may have ponded behind this dam,
- Should a release of solid waste material occur, WMH employees will monitor the existing storm water outfall location and initiate beach assessments, clean up activities, and post signs in those areas likely to be affected by a release.